

Lessons Learned in Developing Potential Analyses to Serve as the Basis for Energy Savings Goals

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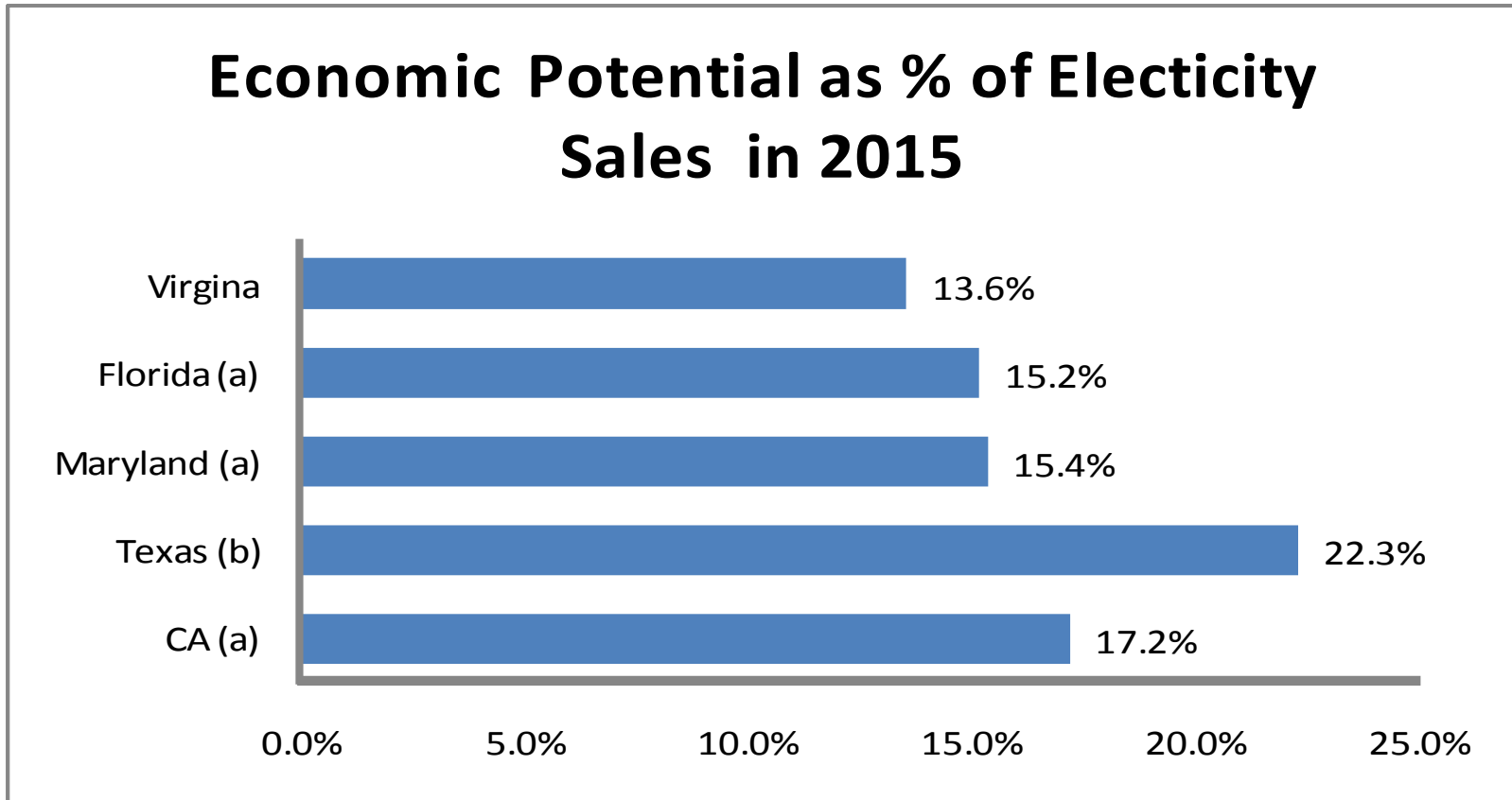
Introduction and Summary

- Compare results of Economic & Achievable Savings Analysis across different states and analysis methods
- Examine key similarities and differences in scope, methods and data used to produce saving results
- Discuss role of potential studies in developing energy savings goals.
- Discuss lessons learned in translating potential to savings goals

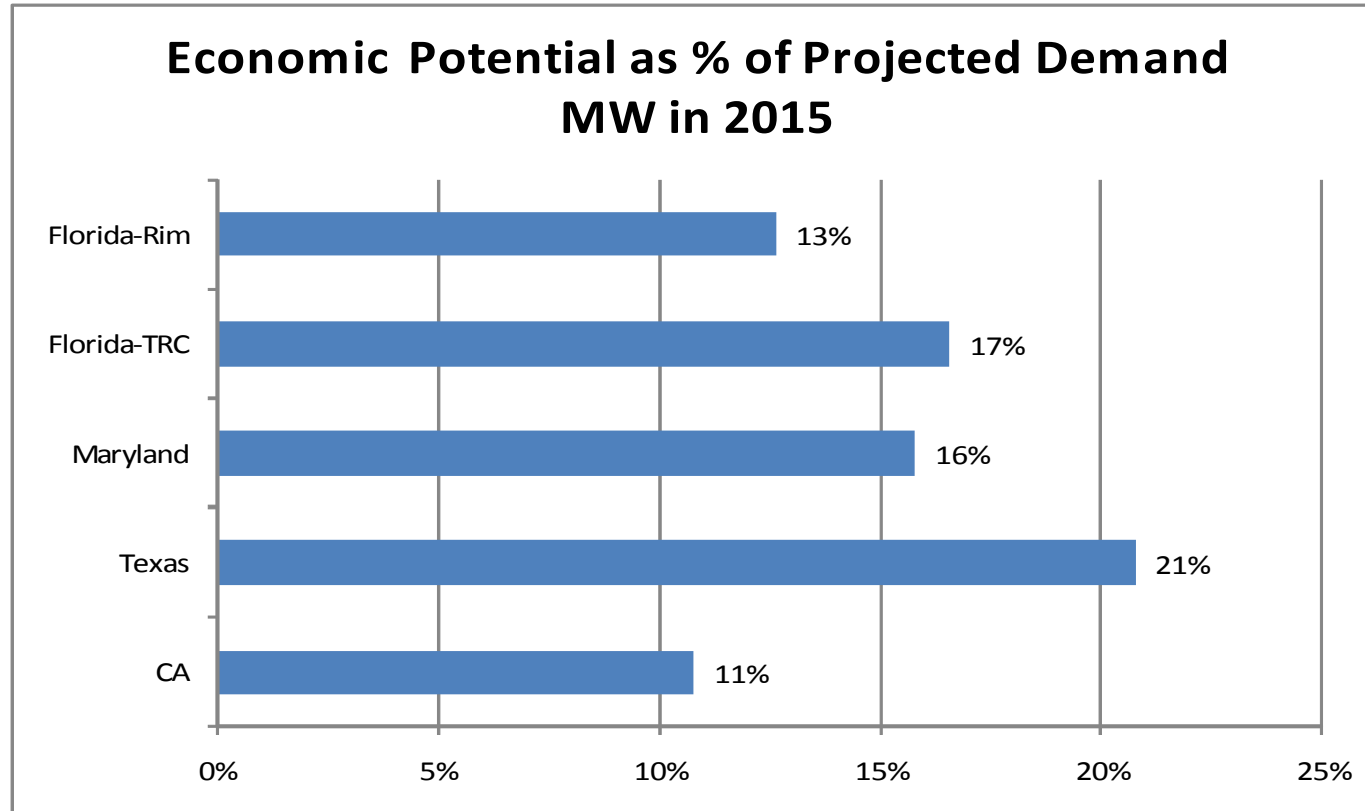
Energy Efficiency Potential Studies Reviewed

- ***Scenario Analysis to Support Updates to the CPUC Savings Goals*** (Itron; June, 2008)
- ***Florida Potential Study*** (Itron, April, 2009)
- ***Assessment of the Feasible and Achievable Levels of Electricity Savings from Investor Owned Utilities in Texas: 2009-2018*** (Itron, Dec, 2008)
- ***Energy Efficiency the First Fuel for A Clean Future Resources for Meeting Maryland's Electricity Needs*** (ACEEE, Feb, 2008)
- ***ENERGIZING VIRGINIA: EFFICIENCY FIRST*** (ACEEE, Sept, 2008)

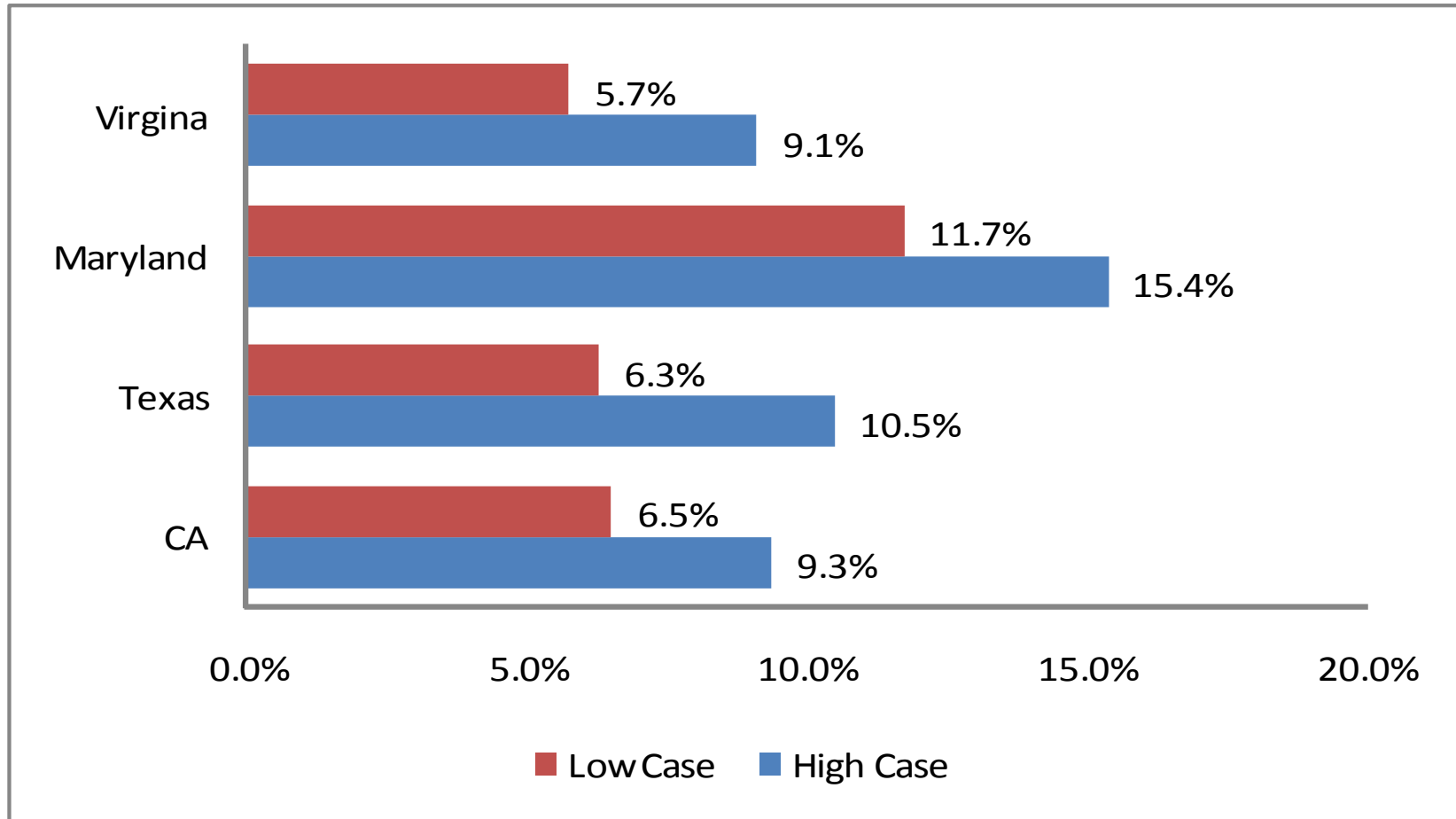
Comparison of Economic Electricity Savings as % of Sales Forecast in 2015



Comparison of Economic Demand Savings as % of Demand Forecast in 2015



Comparison of Achievable Savings Potential Results % of Forecast Electric Sales in 2015*



Key Similarities between Potential Models

- Efficiency Measure lists are very comparable
- Most use TRC test or variant as economic screen
- Desire to estimate economic and then achievable savings
- Most require forecasts of avoided costs and rates
- Most include stock constraints on measure adoption (applicability) but differ in method of assessing what fraction of population will adopt a specific measure

Key Differences in Achievable Potential Studies

- Scope Differences-
 - > Utility Programs and or Appliance Standards and or Policies
 - > Include technological change, emerging technologies, impact of smart grid control technologies in forecast?
 - > Program Specific Net or Total Market Gross
- Economic Screening Tests
 - > TRC, RIM, and/or Simple Payback floors
- Infrastructure Assessment or Program Infrastructure limits
 - > Ability to reach all customer types via various media channels
 - > Ability to raise money through ratepayers to fund programs

Data Availability Guides the choice of Potential Study Methods and Absolute Savings Results

- Intensive Primary Data Collection tends to produce lower savings results due to better data on measure applicability and naturally occurring energy efficiency/savings
- Use of secondary savings data for new states tends to produce higher achievable saving results with more uncertainty.
- Policy judgments about how customers respond to program offerings and the likely level of naturally occurring savings has a crucial effect on study outcomes.

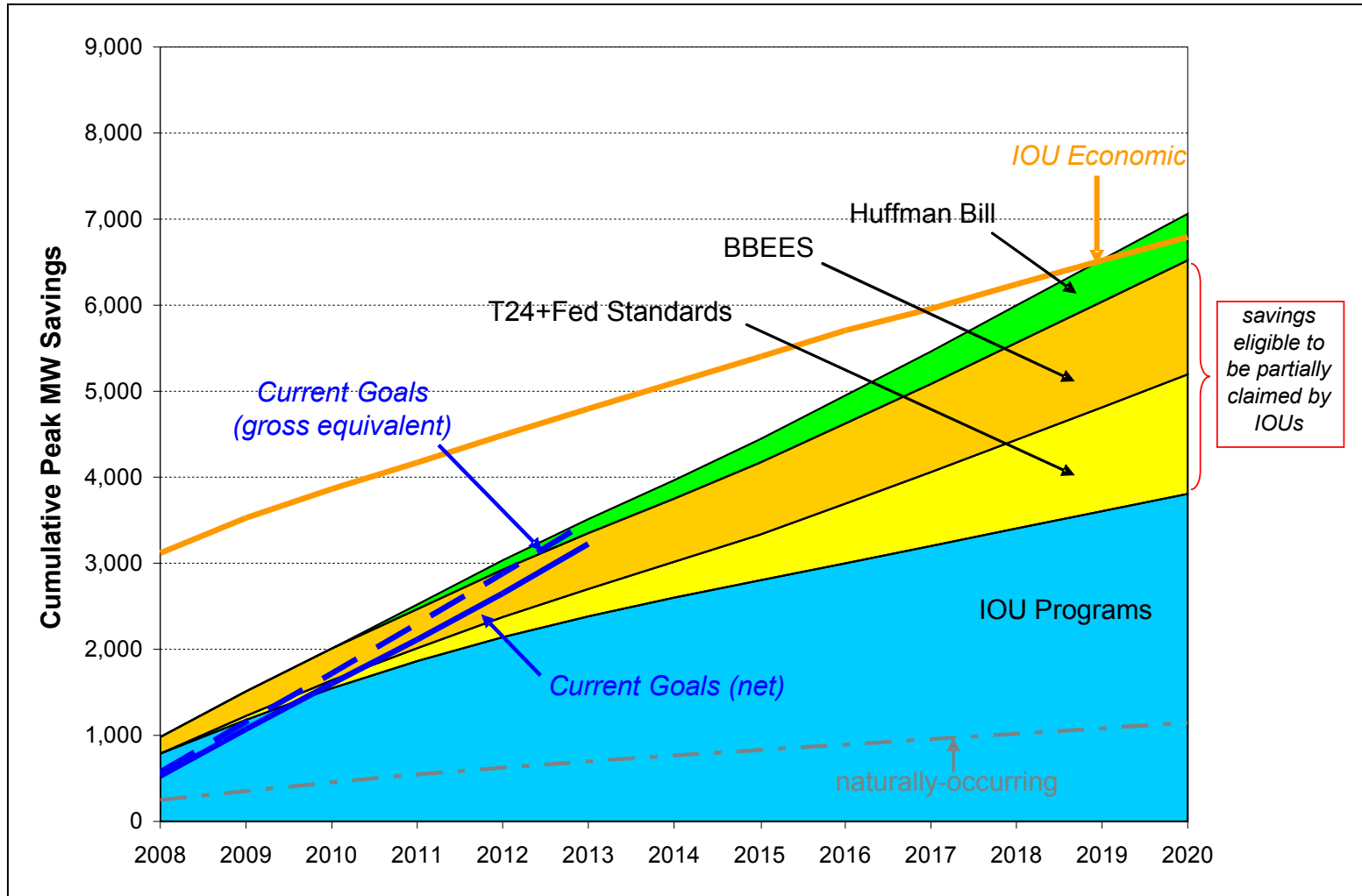
Potentials Analysis Methods Choice- Top Down vs Bottoms Up Methods

- Top Down Potential Methods focus on Customer and Building Constraints to reduce Economic to Achievable
- Bottoms Up Assessment of Program infrastructure- Feasible Rate of Program Growth integrated with forecast of Naturally Occurring Savings
- Rate impacts or Shareholder Incentive Magnitude may be limiting factor in program ramp up rates but not modeled
- Program Savings Interactions with other state Programs, Demand Response and Renewable Programs may be limiting factor in top down analysis

Lessons from these Comparisons

- Economic Savings Results remarkably similar given differences in scope of measures, methods of predicting customer adoptions, and forecasts of service demand in these states
- Biggest differences in achievable savings results relate to scope of programs considered, industrial mix, and methods used to account for naturally occurring savings
- Trend is toward use of models that simultaneously predict savings from utility programs, building and appliance standards and policy initiatives like Huffman bill or Federal lighting standards. Interactions are not well understood.

Delivery Mechanism Interactions in California and Scope Differences- CA example



Evolution of Achievable Potential Methods

- Stage 1-End use focus on economic potential, assertion that programs can bridge all of gap between naturally occurring and potential
- Stage 2-Focus on modeling adoption by customer segment and naturally occurring savings
- Stage 3-Focus on identifying savings attributed to multiple delivery mechanisms and interactive effects
- Stage 4- Movement from Net Savings to Total Market Gross for Setting Savings goals
- Stage 5-Focus on modeling changes in customer usage patterns and behavior in response to multiple stimuli.

Role of Potential Studies in Setting Goals

- Varies by State and Final Decision maker
- Goals set by regulatory body tend to track study results more closely, particularly if incentives/ penalties are involved
- Goals set by legislature are dominated by lobbying and use of case studies, “If state x can do this, surely we can!”
- Should goals change when measure level adjustments in savings are discovered in load impact studies?
- Funding caps added by Legislatures tend to backfire, in the sense that programs are close in mid year.
- Differential effects when setting EERS goals for utilities starting at much different levels of savings as % of sales

Transforming Potential Study Results into Savings

Goal Metrics

- Different Treatment of Naturally Occurring Saving trends in Potential Models leads to use of different metrics, utility gross, utility net or total market gross savings
- Setting Absolute savings goals, % of incremental growth or % of annual sales has strong equity impacts for different size states and utilities (see Texas example)
- Energy Service Demand Forecast Variations are significant across states and may contribute to different absolute savings levels
- Metric Evolution- Gross Savings, Net Savings, to Total Market Gross

Lessons Learned- Key Uncertainties-Data

- Baseline hours of operation are often highly uncertain and may vary across technology types/segments
- Modeling Interaction of customer behavior and efficiency investments is likely to get more difficult
- Absolute Savings Goals are often linked to forecasts of energy service demand, higher service demand = higher estimates of savings and conversely
- Unexpected changes in service demand require savings goals changes- Change goals every three years??

Lessons Learned-Policy (continued)

- Focus on meeting fixed increments in demand through EE can hurt small utilities with high growth rates- (Texas)
- Infrastructure and Greed provide Constraints on effectiveness of performance incentive systems- \$ higher = more scrutiny and lower savings
- End Goal in Energy Efficiency Evolution (Resource Acquisition compared to Market Transformation) is still uncertain and this has big effect on metrics chosen
- Decision not to forecast adoptions of emerging technologies has proven to be wise- (eg microwave dryers) never made it
- Comparisons of Savings results across jurisdictions are plagued by apples and orange problems

Extra Slides if there is more time

Future Uses of Efficiency Potential Studies (EPS)

- What will be the future uses of EPS?
 - > Identify Market segments with Potential Savings?
 - > Used to develop EERS standards at nation, state or local level?
 - > Assess interaction of energy efficiency investments with growth in energy service demand?
 - > Assess EE market opportunities for venture capital firms or developing countries?
 - > None of the above, no more EPS needed

Comparison of Annual Savings Results

- Range of predicted achievable savings in studies ranges 0.5% to 1.5% of annual sales for five to ten years out. Differences crucially dependent on program scope, maturity of building and Appliance standards and baseline usage
- Example Utility program savings from new construction are almost non existent in Cal. whereas savings from new construction with Energy Star programs is significant in Texas with less stringent bldg and appliance standards
- Areas with significant program experience have seen declines in projected achievable program savings as a percentage of sales. (CA, MA)

Impact of Switch to New Savings Metric in 2015 in Texas

Utility	Reported Savings 2007 Savings MW	Saving Goals for 2010		Saving Goals for 2015		2015 Difference Base MW Goal vs Incre. MW (%)
		30% of Inc. growth MW	.3% of Basw Pk MW	50% of Inc Growth MW	.5% of base Pk MW	
Oncor	65	81.6	69.0	174.3	122.7	-42%
Centerpoint	39	43.0	52.3	134.3	96.5	-39%
AEP-SWEPSCO	2	6.0	5.4	12.2	9.5	-29%
AEP-Central	9	9.1	15.4	25.1	27.1	7%
AEP-North	11	0.6	2.6	2.8	4.5	38%
Entergy	5	7.4	10.1	37.8	18.6	-103%
SPS-Xcel	4	5	6	16	10	-53%
El Paso Electric	1	9.6	3.6	18.9	7.0	-172%
TNMP	2	9.7	3.6	14.6	7.0	-110%

MW goals resulting from new metric of .3 or .5% of peak demand
Small Utilities that Benefit from the Change in Metric